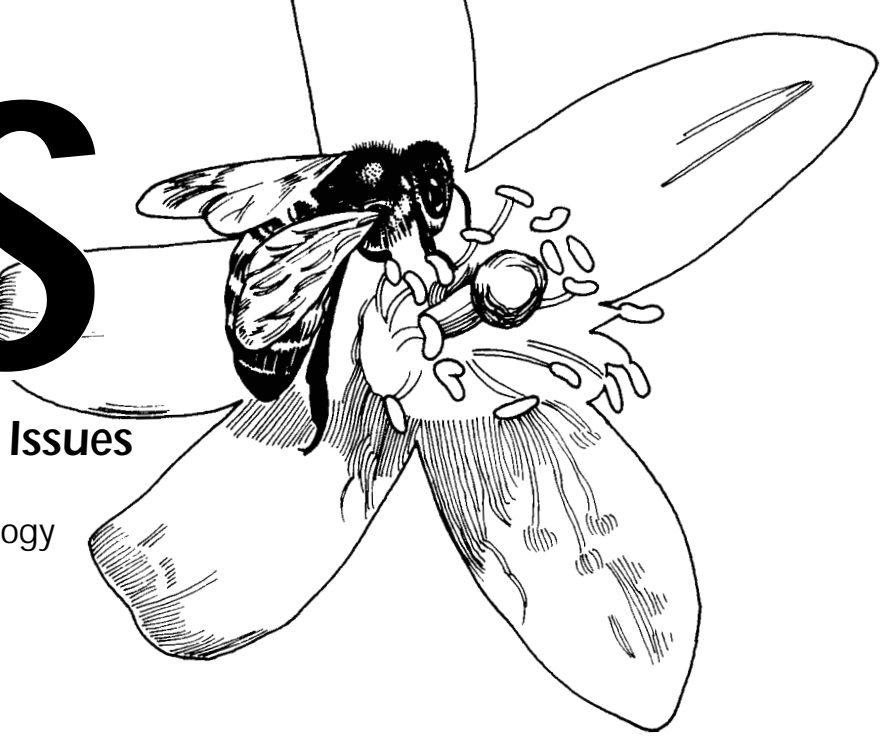


APIS



Apicultural Information and Issues

From IFAS/University of Florida
Department of Entomology and Nematology

September 1997

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Florida State Meeting

A bonus seminar is offered.

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State Beekeepers to Meet in Pensacola

THE FLORIDA STATE BEEKEEPERS ASSOCIATION will have its annual meeting in Pensacola October 23–25, 1997, at the Holiday Inn University Mall. There will be a special bonus this year because the annual Escarosa Beekeepers Association beekeeping seminar is scheduled on that Saturday. The convention will begin Thursday morning with the Board of Managers meeting followed by an organized lunch. The official opening ceremony is 1:30 p.m. That session will end at 4 p.m., enabling participants to travel to Langley Bell 4-H Center where the traditional free barbeque will be held. The convention will reconvene at the Holiday Inn Friday morning, followed by a business meeting and banquet that evening.

Featured speakers this year are Ms. Betsy Woodward, director of the Florida Department of Agriculture and Consumer Services Food Laboratory, and Dr. H. Shimanuki of the Beltsville, MD, USDA ARS Bee Laboratory. Steve Conlon, representing the National Honey Board, and Oscar Coindreau, world sales manager for Apistan®, will also be on hand.

For accommodations, call the hotel directly at (904) 474-0100 or (800) 465-4329. The special rate for the event is \$68 single/double plus tax. The registration fee for the convention is \$40, if paid before October 15. After that date, add \$5. To register, or for more information, contact Charlotte Randall, 389 S. Central Ave., Umatilla, FL 32784, tel (800) 862-9351, fax (352) 669-8607. The seminar will cost \$10; add \$5 for lunch. Registration for the seminar is possible when pre-registering or while at the state convention. For detailed information on this specific event, contact Doc Bullard, (850) 478-7690. ■

Queen Storage: The Pheromonal Connection

THERE HAS BEEN DISCUSSION lately across the Internet about storing queens. Mr. Trevor Weatherhead was kind enough to send me a paper by retired researcher G.J. Kleinschmidt, "Banking of Queen Honey Bees." This Australian study compared free-flying hives with packages and mailing cages. Six hundred forty-three queens were banked from 21 to 65 days. There was an initial death level of 0–15 percent during the first 10 days. After that, most queens lived until day 30. Death levels as high as 70 percent were found after 30 days, especially when high levels of *Nosema* were present.

Commercial cooperators and Queensland Agricultural College, where the study was conducted, provided mated queens. They were weighed when introduced to banks and after being removed. In addition, the queens were inspected for body damage (10 measurements) and examined for *Nosema* spores. After being introduced, queens were weighed every seven days for three weeks and their egg-laying was measured. Performance was again evaluated at 12 weeks.

One hundred sixty-one banked queens were introduced into nuclei. One hundred eight were accepted; 105 were still alive at three weeks and 53 performed satisfactorily 12 weeks later.

Initial queen weight varied about 46 percent. This indicated a need for improvement in rearing methods, according to the author. Although queen weight cannot be discounted as an important factor, it was not considered significant here in acceptance, initial egg-laying rate or survival in the banks.

Colonies were not treated to suppress *Nosema* in the study. Spore levels in free-flying hives were less than 200,000 in all but two. In these, the levels declined over time from 620,000 and 870,000 to 500,000 and 440,000 respectively. Queens themselves in these banks had 20,000 spores. Worker bees in packages had no spores, but after 20 days of wet conditions, recorded 3.85 million to 13.6 million. Predictably, those stored in cold

and/or air-conditioned rooms had highest levels. For more on *Nosema* see <http://hammock.ifas.ufl.edu/txt/fairs/1289>.

Body damage to queens appeared minimal. It was less than 4 percent in some treatments, but up to 36 percent of queens in large mailing cages suffered "movement disability."

CONCLUSIONS from this study are that queen storage in nuclei is preferable to banking in most cases. The latter is best carried out for a maximum of one queen production cycle (20–25 days) and in free-flying colonies fed pollen and sugar. In addition, while queen weight is important in colony performance, it is not a satisfactory guide for evaluating results in banking queens. Finally, the levels of *Nosema* in the study indicate that feeding fumagillin should also be considered in most banking situations.

Pheromone levels of mated, banked queens were also measured, according to

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Queen storage in nuclei is preferable to banking in most cases.

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- G.J. Kleinschmidt

the author, but the specific method used to determine them was not described. Nevertheless, it was concluded that some colonies holding banked queens for 20 to 40 days were not prevented from producing laying workers or attempting to rear queens because of lowered pheromone levels. This notion of royal pheromone control, however, must be tempered by other evidence that brood pheromone also plays a large role in determining classic queenless colony behavior (see August 1997 *APIS*). If the latter is true, it provides evidence that banking queens in a broodless situation may be far more risky than previously thought. ■

The AHB Out West: Africanized Bees Make Their Mark

THE AHB OFFICIALLY ARRIVED in Arizona in June 1993, according to G.M. Loper (*American Bee Journal*, Vol. 137, No. 9, pp. 669–671, 1997). Since then, these bees have contributed genes to the honey bee population not found before that date. These are expressed in several ways, but most noticeably in some extreme defensive behavior in the field. Mr. Loper analyzed 22 colonies in the Tucson, AZ, area using a number of methods. Results were surprising; biochemical methods did not correlate well with the official USDA/ID method. Neither did measurements of defensive behavior. Biochemical analysis revealed levels of certain enzymes (malate dehydrogenase and hexokinase) that were not present before 1993. In addition, only

four colonies of 400 sampled in the area from 1987 to 1993 were found to have even the slightest level of Africanization, and that was from *Apis mellifera lamarckii* (see July 1994 *APIS*).

The arrival of the AHB in Arizona has affected beekeepers and the general public in several ways, again mostly because of increased defensive behavior. The author recommends regular requeening with known European stock to maintain the public's perception of responsible beekeeping. The effect of the AHB population on that of the feral European honey bee population has yet to be fully understood. Muddying the waters is the estimate that perhaps 95 percent of the European population was lost to both tracheal and *Varroa* mites over the last

few years, coinciding with appearance of the AHB.

Dr. Eric Mussen in his California newsletter *From the UC Apiaries* (July/August 1997) reveals more information about AHB in Tucson, site of the most recent Western Apicultural Society (WAS) meeting. Dr. Steven Thoenes, who runs a commercial bee-removal service, is quoted as saying that in three years, the frequency of swarming in the region increased tenfold due to AHB influence (see April 1993 *APIS*). A most interesting observation by Dr. Thoenes is that while *Varroa* is commonly found on European honey bees in the area, it is not present to a great degree on AHB (see May 1997 *APIS*).

A local beekeeper also described his experiences with AHB, according to Dr. Mussen. Much of what he said corroborates previous writings about these bees (see January 1994 *APIS*). Characteristics include extreme variations in defensive behavior, nervousness on the combs, leaving the comb in waves, willingness to be combined at night while fighting in the daytime, ability to nest in small spaces and persistence in following intruders far from the colony and bee yard. AHB is also a small bee as are its clusters, which tend to break apart in clumps. The bees also use a lot of propolis.

The good news is that AHB does produce more honey in the Tucson environment, if provided lots of room to prevent swarming. Although both tracheal mites and *Varroa* infestations are lower than in EHB, chalkbrood incidence is up. I remember being told by Dr. Giovanni Onore in Ecuador some years ago that there were problems with chalkbrood in AHB colonies found in the high Andes.

REQUEENING AHB colonies is a particular challenge in the Tucson area. They immediately begin to rear queen cells when the old queen is removed. Evidence from a study by Ernesto Guzmán-Novoa and colleagues (*American Bee Journal*, Vol. 137, No. 9, pp. 667–8, September 1997) shows little difference in queen introductory acceptance when comparing EHB and AHB colonies in Mexico, suggesting that classic introduction techniques may continue to work in Africanized areas. Find-

ing the old queen is not easy in AHB colonies, however, and techniques may be needed other than those customarily used by beekeepers (see September 1995 and 1997 *APIS*). However, a colony's temperament can turn around quickly when EHB queens are substituted. Again, the public relations aspect of this activity is also important for local beekeepers' reputations.

Dr. Mussen also related a discussion by Dr. Gloria DeGrandi-Hoffman on the mechanism by which AHB becomes dominant in an area. It appears that because AHB queens develop faster, mixed colonies will preferentially rear them over EHB. Thus, EHB supersedure

queens mated with AHB drones result in an evermore Africanized population. This corroborates study by Dr. Glenn Hall at the University of Florida showing that that hybridization is asymmetrical toward the drone side (see February 1990 *APIS*). These AHB father-influenced colonies or "patrilines," are the most defensive, according to Dr. DeGrandi-Hoffman.

AHB has also made a splash in nearby southern California. An article in *California Agriculture* by K. Vischer and associates (Vol. 51, No. 1, pp. 22–25) reports the first detection to have been in October 1994 (see <http://insects.ucr.edu/bees/AHB.html>). *Continued next page*

Long-term Terramycin Use: Prescription for Resistance?

A QUESTION OFTEN ASKED about long-term use of Terramycin® in American foulbrood control is whether there is risk that the causative organism, *Paenibacillus larvae*, will become resistant. A 1994 study comparing the susceptibility to oxytetracycline HCL (the active ingredient in Terramycin) of cultures from old spores (1924) to current spores showed no difference (H. Shimanuki and D. Knox, *American Bee Journal*, Vol. 134, No. 2, pp. 125–126, 1994).

Mr. Kerry Clark, British Columbia's provincial apiarist, wrote to the Bee-L list in November 1996 that the above result seems better than might have been hoped for. It meant that after 40 years of use, resistant strains of *Paenibacillus larvae* were not surviving in the field. This was in spite of many observations on his part that beekeepers used uneven or haphazard doses and employed one product exclusively.

Unfortunately, Mr. Clark said, there's been a recent change, making the appearance of resistance more likely: widespread, nearly continuous use of antibiotic extender patties. A reason for this is the adoption by many beekeepers of long-term vegetable oil patties for tracheal mite control (see December 1995 *APIS*). It seems reasonable that beekeepers would also add Terramycin for foulbrood control in the same treatment to save labor. Thus, the one ingredient that was missing over the last four decades, continuous antibiotic selection pressure on the causative bacterium, is now present, Mr. Clark said. This use also provides much more opportunity for the antibiotic to wind up in the beekeeper's honey crop. While vegetable oil patties may be recommended for tracheal mite control, and while the same patty can be used to apply antibiotic, the latter should be used only for short periods, he concluded.

Some of the practices reported by Mr. Clark may have contributed to resistance development in Argentina (see August 1996 *APIS*). Now there is speculation that long-term exposure to Terramycin may not be without human risk. This use in beekeeping, coupled with others in agricultural systems and human disease control, could mean that apiculturalists themselves are placed in jeopardy from resistant bacteria (see November 1994 *APIS*). ■

AHB Out West continued

The second detection was in March 1995. There were only 12 more during the balance of that year. The article emphasizes that after five years in the United States, the AHB has made limited inroads, and northern expansion has slowed dramatically (see July 1994 *APIS*). The insect faces an uncertain future in the state according to authors (see November 1995 and September 1996 *APIS*). The bee may be reaching its climatic limits or poised on the brink of a major new invasion influenced by climatic change.

Possible impacts of the AHB bee in California mirror those in Arizona and elsewhere, the article concludes. In AHB-dominated areas, it will be more difficult for beekeepers to find locations, and costs are expected to escalate. The results of these may mean disruption of the agricultural industry by reducing the number of colonies available for commercial pollination. Fortunately, the slowing of AHB colonization gives beekeepers, public agencies and the general public time to adapt to this new bee as it becomes a permanent resident in the state. For descriptions of the effects of this bee elsewhere see the September 1996 *APIS*.

Although northward expansion of AHB is limited, Dr. Eric Mussen (*From the UC Apiaries* March/April 1997) reports that the bee continues to be more active in southern California. Eighty-two colonies had been detected

already this year, whereas only 38 were reported in all of 1996. Perhaps, Dr. Mussen concludes, an undetected mass is moving northward from Mexico. Much Mexican beekeeping is dominated by AHB, and the government gave up monitoring some time ago.

Dr. Mussen is more inclined, however, to believe that the flux in Varroa population may be a prime factor. Whereas Varroa was prevalent in 1995 and 1996, this is no longer the case. Beekeepers have now controlled mites in managed colonies, resulting in a smaller population present to potentially infest hives. In addition, feral colonies appear to be more tolerant, some lasting over a year in the wild without treatment. Given these circumstances and the AHB's propensity to swarm more often (see April 1993 *APIS*) and occupy marginal nest sites, Dr. Mussen concludes, it is not surprising that a higher density is being found in southern California.

Establishment of the AHB across the southern parts of Texas, New Mexico, Arizona and California means there continues to be cause for concern in Florida. Even though migration over land has slowed, introduction by ship is still a possibility (see September 1996 *APIS*). As a consequence, the Division of Plant Industry, Florida Department of Agriculture and Consumer Services, continues its trapping and monitoring program around ports. ■

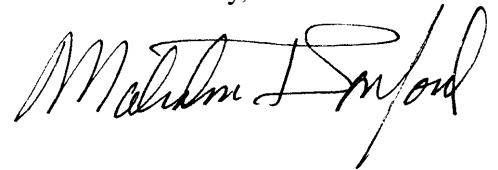
Finding the Queen: Eternal Beekeeping Problem

AN ARTICLE PUBLISHED by Ernesto Guzmán-Novoa and colleagues (*American Bee Journal*, Vol. 137, No. 9, pp. 665-666, September 1997) addressed one of beekeeping's long-standing problems: finding the queen. The results show that beekeepers might need to change their methods in AHB country.

Since those bees run and are not calm on the comb, smoking and shaking to drive the queen off the combs and/or through an excluder can be labor saving. In the study, these techniques were up to 50 percent faster than looking for queen in the traditional way.

There are some caveats to this, however. Smoking and shaking should be undertaken in remote areas or where a lot of European colonies are located to keep defensive behavior to reasonable levels. Other methods have also been recommended using these bees (see September 1995 *APIS*). ■

Sincerely,



APIS, a monthly newsletter, is celebrating its 15th year of service to beekeepers. For subscription or other information, please write, phone, fax or e-mail.

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